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ABSTRACT

Using school records, questionnaires, interviews, and psychological tests, researchers studied the factors affecting academic achievement in a large, urban, technical high school. For 20 high-achieving and 20 low-achieving seniors, data were gathered on sex, ethnicity, personality factors, high school and college entrance test scores, grade point averages, areas of concentration, attendance, activities, study habits, school motivation, academic self-concept, self-perception of problems, successes, failures, and influences of peers, family, and school personnel on decisions regarding school, program, and college selection. Information came not only from students but also from parents, teachers, and friends. Crosstabulation of the data led the authors to conclude that family influences strongly affect achievement through their impact on student self-confidence and independence; that peer networks, or school culture, are important influences on program and college decisions; that female students have a higher self-image and better achievement records; and that gender and ethnicity are related to student independence and motivation, which in turn affect student achievement. (RW)

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School Culture and Academic Achievement: A Cross-gender, Cross-cultural Study

by

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EA 014 572

Presented at the annual meeting of The American Educational Research Association New York, March 1982.

Can academic achievement occur in spite of a particular high school setting rather than because of it? In a student population of over 5,000, how does peer culture interact with academic achievement? When the admissions procedure of such a school is limited by law to the results of a competitive examination, what results when the school population changes from white, middle-class, and male to multi-ethnic, from a wide range of socioeconomic backgrounds, and coeducational? What is the role of personality characteristics in coping with the demands of the rigidly structured, technical/academic curriculum of this school? Does the family provide a functioning support system in this setting--or does it create psychological or cultural conflicts? Within an organizational framework basically unchanged during its 60 years and originally male-oriented, how does the achievement of females compare with that of males? What complicating factors does gender add? In today's climate of almost overwhelmingly rapid technological change, can such a school justify its present form?

These questions begin to describe some of the issues facing Southwest Technical High School, situated near the center of a major urban area and describing itself as "a unique polytechnic environment for selected, superior students." Currently (1981-1982), it has a student population of 5300. The total staff number, including teachers, administrative, guidance and secretarial personnel, school aides, and security guards, is 250.

Established in the early 20's, Southwest Technical High School was originally concerned about those academically talented young men who were inclined towards engineering and technology but who would not normally attend college. Thus, Southwest Technical High School became part of a specialized high school system with a select population, determined by competitive examination. The curriculum included all the requirements for an academic diploma, in addition to a demanding, college-level component of science and technology. Tech's existence became even more socially significant with the crippling consequences of the Depression.

The G.I. Bill and post-war prosperity expanded educational horizons. Consequently, the needs of Tech's population changed. Sputnik increased the need for advanced preparation for the increasingly complex demands of our technology. By the end of the 1950's, most of the Tech student population was going to college. Language lost its optional status in the elite college preparatory program to become a 9th and 10th grade requirement. (Presently, 95% of Tech's graduates are admitted to four-year colleges.)

The social turmoil of the 1960's produced further curriculum revisions, changed attitudes and awarenesses of students' rights at Tech as well as elsewhere. Perhaps the most significant change was the admission of two female students in the late 1960s. The next entering class, however, made history as its graduates included nine young women. As a result of these changes, today's Tech student

population reflects society in terms of gender and the ethnic, cultural, socio-economic diversity of its constituency. However, the changing ethnic composition and the increasing numbers of female students makes this a very different school culture from that when the school first opened its doors.

With respect to curriculum, 9th and 10th graders currently take a full course load of five academic subjects (English, mathematics, science, social studies or art/music and language) as well as health education, shop and technical or freehand drawing. In the 11th grade, students choose one of nine areas of specialization: aeronautics, architecture, chemistry, civil technology, electricity/electronics, graphics communications, industrial design, mechanical technology, or arts and sciences. Although honors and advanced placement classes produce a system of stratification in academic areas, theoretically, there is no ability grouping or gender exclusion. In practice, there are repeater classes in many subjects, for students who previously failed the same grade of the subject. The curriculum is rather rigidly structured; until recently there was little room for choice within the regular school day (8 periods plus homeroom). Beginning with the current year, electives were allowed in the 10th and 12th years and a required computer literary course was introduced in the 11th grade.

Rationale and Methodology

As recent studies have shown, we have much to learn

about how schools work. For example, little data exist as to how urban high schools meet the needs of their multi-cultural clientele; there is even less on gifted population in specialized high schools. Goodlad (1979) affirms that "schools as total entities are relatively unstudied phenomena" and suggests turning from measures of achievement to the process which generates it. He makes a case for qualitative, naturalistic, ethnographic research. Moreover, Sarason (1971) suggests that schools have their own unique cultures, and maintains that the only justifiable way to study the culture of a school is by entering into a helping relationship with it. The more that researchers are perceived by the participants as understanding the organization, the more valid will their inferences be about the subjects' behaviors. The research, then, should be multi-dimensional in order to reflect the complex interactive relationships among the variables (Pugh, 1977). In this regard, Wilson (1977) contends that quantitative research is inadequate for this perspective, suggesting instead a process consisting of a series of developmental research steps, each stage shaped by data gathered from previous stages. Finally, Sirotnik and Oakes (1981), writing out of their own recent experience with Goodlad's "A Study of Schooling," strengthen the case for the study of contextual variables; they maintain that schools should practice what they teach--learning as much as they can about a situation, in this case themselves, before attempting to define problems and arrive at solutions.

This rationale for analyzing school settings and the particular nature of Southwest Technical High School led to the formulation of a central research question: what are the cross-gender, multi-cultural dynamics of academic achievement at Southwest Technical High School? Specifically, the study examined these four interacting contextual variables:

1. the individual: how do personality characteristics such as motivation, self-esteem, and independence interact with gender and ethnicity to affect academic achievement(grade point average)?
2. the family: what is the cross-gender cross-cultural role of family influence in the development of these characteristics and as a support system in this school setting?
3. peer influence: does the adolescent culture influence the cross-gender, multi-cultural manipulation of the school culture to affect achievement?
4. the school setting: are there any common variables in the school experience of "low" as compared to "high" achievers? To what extent do these factors cross-gender or ethnicity?

Because on-going observations of the class of 1981 suggested that the contextual variables might have had some effect on its members academic achievement and, therefore, rank in class (based on grade point average), to which entrance exam scores bore little relation, the highest 100 and lowest 100 in the class ranks was selected for preliminary study. Factors examined for these subjects included gender, entrance scores, areas of concentration, PSAT/SAT scores and the identity and location of their feeder schools. A sample of 20 subjects was then chosen from each of these groups

for further study. To some degree, the sample was a selected sample, but was designed to reflect the gender and ethnic composition of the student population, as well as the major programs of study.

A variety of data collection devices was used, including:

1. All available documents and records for this sample were reviewed for evidence of common or uncommon experiences which might have been related to the degree of achievement.
2. The subjects filled out an extensive questionnaire eliciting data on various factors which had influenced significant choices in their high school lives: the decision to attend Southwest Tech, what program to concentrate on there, and what colleges to apply to. The factors probed included family involvement, peer interaction, attendance, activities, study habits and self-perceptions of successes, failures, and problems.
3. This questionnaire became the basis of an in-depth interview to provide additional anecdotal data.
4. Each subject subsequently responded to the Student Attitude Measure (SAM: Scott Foresman) which assesses motivation for schooling, academic self-concept (both performance and reference based), student's sense of control over school performance and instructional mastery.
5. From this group of 40 subjects, an additional ten students were selected (five from the upper and five from the lower ranks) for further analysis of the student's perception of the interaction of the variables. This process included:
   a. questionnaires filled out by their parents, two teachers of the subject's choice (one academic and one technical), and two friends, also chosen by the student;
   b. interviews with parents, a teacher and a friend.

This research strategy provided a richness of content and technical generally unavailable under other circumstances. The first benefit of total immersion in the setting was the ease with which parental anxieties were allayed about the participation of their sons and daughters in the study. Second, ease of access greatly facilitated the completion of

questionnaires and interviews with the entire sample. This access bility also permitted the modification of the sample as provocative information about eventual subjects revealed itself. In addition, only a long-standing relationship with the faculty as a whole can account for a 100 percent response from teacher participants--within two days at the very close of the school year. Moreover, the helping relationship between subject and researcher which Sarason (1971) advocates also facilitated the climate of trust needed in this sort of research. The conclusions in this paper about the workings of peer group networks and the "grapevine" they support amply demonstrate the point. Finally, the researcher's position in the school permitted real assistance to the student sample on many occasions--from simple advice on needed resources to direct intervention in a problem. As a result, the students perceived themselves as the beneficiaries of extra-ordinary assistance. Consequently, in this study the method itself was the message.

Parental and Family Influences: An Overview

The Southwest Tech student body begins its interaction with the unique culture of the school either armed with a set of coping mechanisms or unprotected for lack of them. These mechanisms are the product of two interacting variables: the family unit of which the young adult is a member, along with its particular ethnic and cultural values. For better or worse, parents affect their children's academic success at

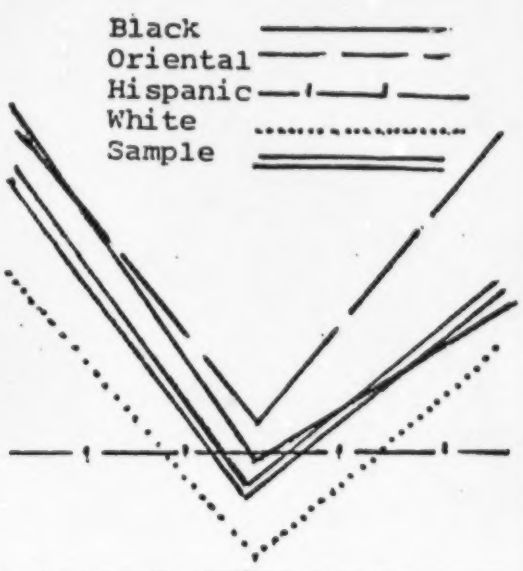
Southwest Tech (see Figure 1). For example, there is considerable

Fig. 1 Pattern of Parental Influence on Student Choices:

Choices

Groups	n	% of Influence: Tech	Program	College
Hispanic	4	25	25	25
Oriental	7	71	29	71
White	10	50	10	40
Black	19	74	21	47
Sample	40	63	20	49

Patterns



evidence that parents influence the major decisions their children make about their academic lives: the decision to attend Southwest Tech (63%), the program of technical studies for the 11th and 12th years (20%), and the college selection process (48%). Although there is an unmistakeable similarity in the degree of influence among the ethnic groups, there is no relationship to rank in class or to gender. How can this fact be explained?

The one major exception to the pattern of similarity is the unique Hispanic (N=4; 2 females, 2 males) response, directly linked to cultural values. Strong family ties foster an attitude of achievement as a matter of fulfilling personal responsibilities to family pride. Competition and

ambition are frowned upon as unnecessary emphases on individuality. This outlook is particularly relevant in the metropolitan area where Southwest Tech is located. Encouraging children's ambitions in a multi-cultural milieu can only lead to weakening the family influence which most Hispanics regard as essential to their survival in an urban area where prejudice and poverty have come to be taken for granted by this group (Sowell, 1980).

The fact that no Hispanic names appear in the lowest 100 academic ranks and only four in the highest 100 ranks tends to validate this analysis. Understanding how these four eluded the trend of Hispanic Technites to cluster in the middle ranks further illustrate the operation of this ethnic/cultural value. Miguel's ability was recognized in elementary school, resulting in his subsequent enrollment at a non-zoned junior high school emphasizing programs for the gifted. Here he received the impetus to develop his talents fully. Parental support followed because they perceived this level of achievement as a minimum standard for Miguel in the school he happened to be attending. Junior's father is a mechanical engineer. Although traditional (Freudian) father-son rivalry spurred Junior to surpass his father's accomplishments, culture required a "macho" face-saving mechanism. Thus, he was more often than not perceived by the educational establishment as a West Side Story personality than a student in the top 10% of his class. Maria and Mary best exemplify the conflict between competing sets of values. They had achieved

the 4th and 7th positions in the academic ranks at the beginning of data collection. However, interview data revealed that their parents were bewildered by these young women's acceptance of the level of ambition and competitiveness required to attain that status. Nevertheless, both students reported some degree of parental and family involvement in all their major high school decisions. Further investigation revealed that they had formed a compensating support system for each other. Ultimately, however, familial values won out. Neither Mary nor Maria was allowed to attend out-of-town colleges which would further the estrangement from their families begun at Southwest Tech.

By contrast, at Southwest Tech, Oriental students (n=7; 1 female, 6 males) have traditionally been perceived as achieving the greatest academic success. The class of 1981 supports the stereotype, with only two Oriental names appearing in the lowest 100 ranks. Data from all available sources supports the theory that when the family espouses the traditionally high value placed on education, it also provides the required encouragement and support (Chen, 1981). Academic success is thus taken for granted, and the individual is held responsible for any real or perceived failures since support and guidance is directed at achieving independence for the children rather than at maintaining control of them.

Understandably, then, all Oriental students in the sample report parental influence on all major student choices. This ethnic group exerts the greatest influence in the area of

college selection, in keeping with the emphasis on education. The one exception to this general pattern is Steven, in the lower ranks. He attributes his decision to follow the Aeronautical program to himself, not to his parents' influence, since that choice had to be made when his parents were in the Far East on business and he and a younger brother had been left in the care of an aging, non-English speaking grandmother. Two years later he was able to link his susceptibility to peer influence at that time to a corresponding decrease in academic performance. Eventually, Steven reversed his past failures to graduate on time. However, although his parents, teachers and friends regarded this as a praiseworthy achievement, Steven did not find the concept of "success" applicable to him. This negative case illustrates the high premium placed on academic success in the Oriental culture and how it affects student self-perception of achievement.

The white students (n=10; 2 females, 8 males) further illustrate the importance of family support on academic achievement at Southwest Tech. Only one of the four males in the lower ranks reported any degree of parental influence on the major decisions these students made relative to their high school careers. Some understanding of this fact comes from the realization that three of the families suffered stress from such problems as alcoholism, poverty, unstable marriages, single parenting, and abuse. Tom's family, on the other hand, was unique in its total detachment from his high school activities. Interview data supported the link between family

instability or uninvolvement and the problems these students encountered in coping with the highly structured, inflexible curriculum and organizational structure of Southwest Tech. Conversely, in the upper ranks, family stability provided a fertile atmosphere for nurturing independence. The result is that these students sensed rather than were dominated by parental influence. Interestingly, the two females in the upper ranks reported the least parental and family influence on their decisions.

The causes and results of family instability also provide insights into Black academic achievement at Southwest Tech. Of the six Black students affected by family problems, all (four females, two males) were in the lower ranks and two of these (one male, one female) left Tech before graduating. Of the remaining nine Black students in the lower ranks, interview data suggest that for as many as six of them parental involvement took the form of dominance or at least a reluctance to surrender the child to the larger, white-value dominated society. This pattern is consistently documented in the literature (Sowell, 1980; Banks, 1978) which details the strong ties Black families maintain for mutual support against a hostile environment, viewing the loss of potential Black leaders as a sapping of Black community strength.

Without denying the validity of this view, the evidence remains that in fostering independence and goal-orientation four Black families provided their children (1 female, 3 males) with values necessary to achieving academic success

at Southwest Tech.

In conclusion, each subgroup in the sample of 40 clearly illumines some of the effects of differing cultural expectations. The whites, on the one hand, as members of the dominant culture (although not in this study), exemplify the value of stable family support while, on the other hand, they demonstrate how the dissolution of the family adversely affects academic performance. The Oriental students illustrate the importance of family influence through support for decisions collectively arrived at rather than by the independence from family often shown among the whites. Where Black students from stable families embody the dominant white cultural value of individual independence, they make their way into the upper academic ranks. This also seems possible for Hispanic males, but Hispanic females seem to achieve academic success at Southwest Tech without resolving their cultural conflicts.

School Culture: Organization and Administration

Very early in the study, it became clear that, even in their senior year, the students of Southwest Tech, without regard to gender, ethnicity, or academic rank, had little understanding of the school's organizational structure. Even more obvious was the underlying lack of interaction between the administration and the students, a situation which the students passively accepted.

Fig. 2 Influence on Student Choices by School Personnel

Influence Source:	Sample by Gender	Student Choices of		
		Tech	Program	College
Elem. School Staff	Male	(n) 2	/	/
	Female	(n) 2	/	/
SW Tech Teacher(s)	Male	(n) /	2	10
	Female	(n) /	0	3
SW Tech Guidance	Male	(n) /	4	3
	Female	(n) /	0	0

This disaffection from organizational figures often extends back to the students' elementary and junior high school experiences. For instance, Fig. 2 shows that none of the 40 subjects listed staff members in their previous schools as a primary influence on their decision to come to Southwest Tech and only 10% (n=4) perceived these adults as having even secondary influence on this choice. Furthermore, when choosing a technical program of studies at Southwest Tech, similarly low percentages occur, both for teachers (5%) and the guidance staff (10%). The data about college choices adds to this image of low esteem for school personnel. No one regards the guidance staff as a major influence; only three male students in the upper ranks listed them as a secondary influence. Ironically, although less than 10% of the sample perceive the guidance staff as involved in this major decision, 95% of any Tech graduating class immediately goes on to attend four year colleges, and an additional 2.3% to two-year programs. Some consolation exists in the knowledge that at least two

students (male, lower rank) identified teachers as a primary influence in the college selection process, and 11 more students (27.5%) named teachers as secondary influences.

In view of the limited role that school personnel play in the academic lives of the students, it seems natural that only 25% of the sample viewed the administration as having some effect in their success (see Fig. 3) at Southwest Tech.

Fig. 3 Contributions of Administration to:

		Success				Failures				Problems			
Rank	(n)	1	2	3	N/A	1	2	3	N/A	1	2	3	N/A
Upper	Males (14)	-	-	2	-	-	1	-	10	-	2	1	10
	Females (6)	-	1	4	-				6	-	1	-	1
Lower	Males (15)	1	-	2	5	1	2	-	2	2	3	1	3
	Females (5)	-	-	-	2	-	1	-	1	-	1	-	2

(1, 2, 3= how subjects rank factors)

Even these data are subject to qualification. Since these students often equated teachers with administration, they were most often actually referring to certain teachers who had assisted them. Or, in some instances, they were giving credit to the administration for staffing the school with these excellent teachers. This fact reveals the students' overwhelming naiveté about the realities of staffing procedures in this urban system, where for some time now it has been impossible, short of actual chicanery, to "hand-pick" an entire staff. Further, they were almost totally unaware of such niceties as excessing, layoffs, transfers, licensing procedures, or seniority. In believing present administrators responsible for providing them with valuable educational

experiences, the students were unaware that the only contribution of some of these administrators was the preservation of a long-established status quo.

Surprisingly, the students passed up many chances to list the administration as a negative influence. For example, part of the interview process involved discussing the students' school records with them. Even where it became apparent that there were incorrect entries on the records, or that programming errors had occurred, the students did not associate these administrative faux pas with their own plights. If the students did acknowledge any awareness of these errors or of the price these inaccuracies had exacted, their responses generally took one of two turns: "I thought if they gave me this program, it must be right," or "What could I have done about this?" Although the students in the lower ranks predictably had little knowledge of how to manipulate the organization to meet their needs, the students in the upper ranks were not much more sophisticated in this respect.

Fig. 4 Contributions of Guidance Staff to:

		Success				Failures				Problems			
Rank	(n)	1	2	3	N/A	1	2	3	N/A	1	2	3	N/A
Upper	Males (14)	-	-	1	-	-	-	-	10	-	-	-	10
	Females (6)	-	-	-	-				6	-	-	-	1
Lower	Males (15)	-	-	2	5	-	-	2	2	-	1	-	3
	Females (5)	-	-	-	2	-	-	-	1	-	-	-	2

(1, 2, 3= how subjects rank factors)

The perception of alienation from the organizational structure is further substantiated by the data in Fig. 4. No one ranks the guidance staff first or second in identifying

factors contributing to academic success and only three students, or 7.5% of the sample, rank it third. Paralleling these students' unawareness of the administration's link to their problems and failures is their almost total absence of identification of the guidance staff's contributions to these same difficulties, even though interview data confirmed the existence of these negative influences.

Coaches do not fare much better in the students' assessment (Fig. 5). Even though two students did list coaches as

Fig. 5 Influence of Coaches on:

		Success				Failures				Problems				College Choice	
Rank	(n)	1	2	3	N/A	1	2	3	N/A	1	2	3	N/A	x	✓
Upper	Males (14)	-	1	-	-	-	-	-	10	-	-	-	10	-	2
	Females (6)	-	-	-	-				6	-	-	-	1	-	-
Lower	Males (15)	-	-	1	5	-	-	-	2	-	-	2	3	1	1
	Females (5)	-	1	-	2	-	-	-	1	-	-	-	2	-	-

(1, 2, 3= **how subjects rank factors**)

primary contributors to academic success, these were not athletic coaches. One is the math team coach and the other is the cheerleaders' coach, who is also Student Activities Coordinator with a long-standing reputation for her concern for students. The football coach (also on the guidance staff) alone was ranked third by one lower-rank student.

A total of 35% of the sample perceived the school organization as contributing to their success. Similarly, 33% identify the school as an element of their problems. Eighteen percent view the school as a factor responsible for their failures. In view of these figures, it appears that the

students of Southwest Tech, in both upper and lower ranks, are succeeding - or failing - in spite of the school rather than because of it.

School Culture: Peer Influence

The data examined thus far suggest that the relationship between Southwest Tech and its students is largely characterized by indifference and alienation. Much of the students' success or failure, then, seems attributable to parental/family support, particularly as it encourages independence and goal-orientation. Yet peers often have an important effect on students' aspirations and career choices. How true is this for Southwest Tech?

Fig. 6 Peer Influence on Student Choices

			Tech	Program	College
Upper Ranks	Males	x	0	0	1
		✔	2	4	5
	Females	x	0	0	1
		✔	2	1	5
Lower Ranks	Males	x	1	0	4
		✔	3	1	1
	Females	x	0	0	0
		✔	1	0	3
Portion of Sample			23%	15%	50%
x=Primary Factor			✔=Secondary Factor		

Evidence of peer networking (Fig. 6) exists in all the major areas of academic life. Interestingly, the percentage pattern of peer influence on major decisions roughly follows

the sample's configuration of parent/family influence. Interview data revealed that some of these friendships had begun in previous schools and continued in Tech. The most notable such example is that of Mary and Maria, who formed a mutual support system in their efforts to wean themselves from traditional Hispanic dependency roles for females.

It is likely that the figures for peer influence on the decision to attend Southwest Tech and on the program choice decision are low by comparison with parental/family influence because this latter factor encourages the independent decision-making given most credit by the student sample. Fifty percent of the sample identity "self" as the primary factor in choosing Tech and 53% do so for program choice. However, comparison with the data for school influence (Fig. 2, p. 14) suggests that peers form a support system for these independent choices, thereby compensating for the school's detachment from these decisions.

However, peer influence reportedly is greatest in that area where parental concern is also highest: college selection, with 50% of the sample identifying their friends' involvement in this decision. The disparity again is clear: in the matter of college guidance, where the school prides itself on excellence of service, the students perceive their greatest support coming from family, friends, and information furnished by the colleges themselves.

The exact nature of peer networking is more clearly observable in a college-related area, the PSAT (Preliminary

Scholastic Aptitude Test). During a preliminary records check, a perplexing fact emerged: a large number of students in this graduating class had not taken the PSAT. Since 51% of the student population is Black (1981 Ethnic Survey: U.S.O.C.R.) and this test, a once-only opportunity, yields a selection score both for the National Merit Scholarships and for the National Achievement Program for Black Students, the damaging potential of this omission is clear. In the study sample, only one of the upper rank students did not take the PSAT, and during the interview he voluntarily admitted the folly of his inaction. By contrast, in the lower ranks, only six students (30%) took the PSAT. The total of 25 students who elected this test indicated that they had done so because friends in official or subject classes had urged one another to take the test.

This peer group assumption of a function at which the school proved incompetent and parents inadequate (only 15 mothers and 5 fathers reported earned college degrees) is greatly facilitated by the large amount of time (20-30 class periods a week) spent together in the technical programs: Chemistry, Electronics, Aeronautics, Industrial Design. If the sample's indication of peer and parental influence at its lowest ebb in this decision is representative of the school, it suggests a further reason for difficulties experienced by students in the lower ranks. Judging by the sample, these are the students least prepared for independent decisions, which may explain the fact that of the 20 students in the

lower ranks of the sample, 12, or 60%, had changed from their original program of technical studies to the less demanding Technical Arts and Science program. This all too clearly suggests that for them no mechanism compensated for the school's failure to influence this decision.

It came as no surprise that the Tech students in the sample were also aware of the nature of the influence which their friends have on their academic lives. As in the case

Fig. 7 Contributions of Peers to:

		Success				Failures				Problems			
Rank	(n)	1	2	3	N/A	1	2	3	N/A	1	2	3	N/A
Upper	Males (14)	-	2	6	-	-	1	-	10	1	1	-	10
	Females (6)	-	1	1	2				6	-	2	1	1
Lower	Males (15)	-	3	1	5	-	5	3	2	2	2	1	3
	Females (5)	-	2	1	2	1	1	1	1	1	-	-	2

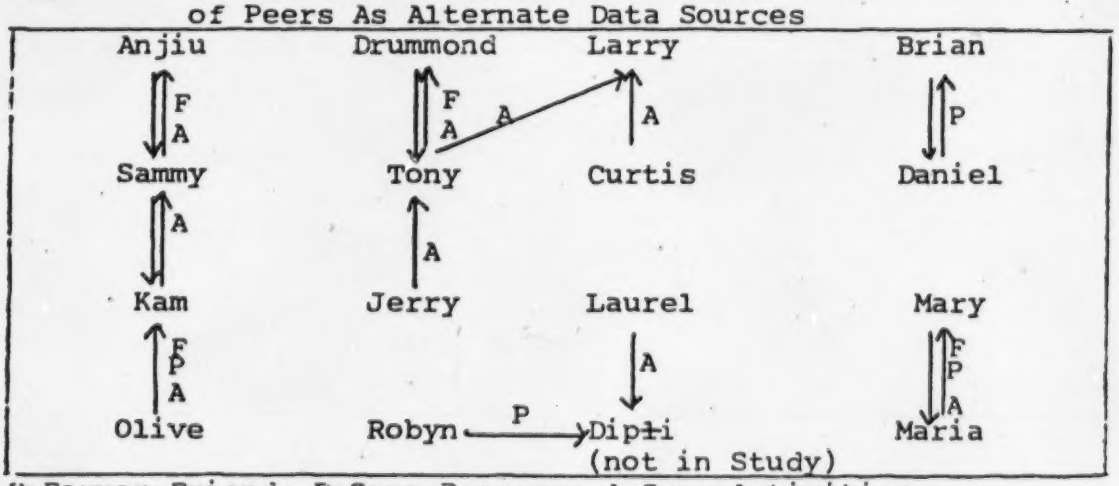
(1, 2, 3= how subjects rank factors)

of influencing decisions, friends ranked third, coming after "self" and parents/family as contributors to academic success, with 43% of the sample ranking them second or third. However, the fact that 30% of the sample said that friends contributed to failures and 28% to problems indicated that the sample realized that not all peer influence is positive. Six lower rank students, three of whom were on the football team, identified friends as contributing both to failures and to problems. Three female students in the upper ranks (although none of the six females in this group saw the term "failure" as relevant to them) maintained that their friends had tried to dissuade them from spending as much time on homework as

they themselves preferred.

Additional evidence about the closeness of the peer networks, especially as related to shared course work and activities, come from the results of the request to name three friends who could supply additional data about the subjects. Critics of Hardy's novels accuse him of too liberal a use of coincidence but this literary technique may accurately reflect reality, at least at Southwest Tech, in view of the fact that 15 of the 40 subjects selected at least one friend in common with another subject (out of a possible 1300 students in the original rankings).

Fig. 8 Examples of Overlap in Selection of Peers As Alternate Data Sources



F=Former Friend; P=Same Program; A=Same Activities

Within this selection of "reference" friends, there is no consistency among gender, ethnicity, or academic ranks. In addition to time spent in common, the length of friendship, often extending to the home neighborhood (Tech students are drawn from a wide geographical area), is an important factor.

However, it was only students in the lower academic ranks of the sample who could not name three school friends. This is additional evidence of how lack of membership in the Tech peer network disassociates these students even further from the school culture, making them even less accessible to the positive influences of their Tech peers. Interview data substantiate this analysis both for the Black and for the white students in the lower ranks. Moreover, all of the students in the lower ranks who identified friends as contributors to academic success maintained that they could not have overcome other intervening negative factors without their friends' help. This was also true of those students in the lower ranks who did not perceive themselves as having achieved success. Therefore, although it is difficult to distinguish cause from effect, it is likely that membership in a peer network is a qualifying condition for entrance into the upper academic ranks at Southwest Tech, where friendships are the mechanism by which students cope with organizational structures which fail to provide the support and guidance they might.

Personality Factors and Achievement

Given the importance of family, and the self-reliance which it inculcates among most of the more successful students at Southwest Tech, the question now becomes: what influence does personality have on the achievement of the students in the study?

With the exception of subjective impressions formed during interviews, most of the study data (i.e., questionnaire responses) did not specifically address this issue. The Student Attitude Measure (Scott Foresman, 1980) filled the need for an additional objective measure inasmuch as the Administration Manual (p. 15) defines its purpose thus: "to facilitate clarification of student satisfaction dimensions of school experience as measured by the five attitude scales" (Motivation For Schooling, Academic Self Concept-Performance Based, Academic Self Concept-Reference Based, Student's Sense of Control Over School Performance, and Instructional Mastery).

However, the data which this instrument yielded must be viewed with certain caveats in mind. First, the measure was standardized on a nationally representative sample, accounting for what at first glance appear to be figures wildly at odds with the percentile ranks derived from national norms. Consequently, the percentile ranks of this sample can only be used for valid comparison among the various sub-groups within this specific research group, such as males compared to females (see "Gender," p. 29ff.), upper rank students as opposed to lower ranks. Even if local norms were available for this urban school district, they would not be useful in comparing the results from this highly selected student population.

Fig. 9 School Attitude Measure
Percentile Comparisons by Rank and Gender

Percentiles:					
Scales:	Total	Upper Rank	Lower Rank	Female	Male
A. Motivation for Schooling	59	67	51	72	55
B. Academic Self Confidence Performance Based	82	86	66	89	76
C. Academic Self Confidence Reference Based	71	84	42	90	52
D. Sense of Control over Performance	78	87	70	93	70
E. Student's Instructional Mastery	42	52	31	61	38

The second caution also stems from the nature of Southwest Tech and its student population. The Student Attitude Measure Administration Manual emphasizes its intention to direct the material on interpretation of scores toward use by the classroom teacher for the individual student. It is made clear that a certain degree of consistency is anticipated, both within the five dimensions of the measure and with other aptitude and achievement data. Discrepancies are a signal of possible counseling needs, or of other student needs not being met by the school organization, such as adjustment problems. A cursory look at the individual profiles of the 31 responding students (three others had left Tech before the measure's administration) revealed that only three had percentile ranks for all five scales falling definitively within the desirable one percentile range. Often the percentile scores were so far apart as to call immediate attention

to themselves. For example, Stephen's 51 percentile score on the Motivation for Schooling Scale is barely above the 18th - 50th percentile range while his 94th and 95th percentile scores on the two Academic Self-Concept Scales place them in the 84th - 99th range. Such scores (for the number one ranking student, especially) must be interpreted very cautiously, taking into account many interrelated factors. One of these factors which could not be ignored with respect to this selected student body is that the perceptions of the gifted about their achievements in proportion to their potential can vary greatly from the perception of the "normal" students. The "normal curve" in a school with a gifted population may only be a myth, and rightly so. The very existence of a homonogeneous student population skewed in the direction of ability must necessarily affect student perceptions of performance, especially when they are using as a standard of comparison for themselves this very group of which they were members.

Nevertheless, there is a distinct parallel between the percentile rank patterns of both upper and lower rank groups; discrepancies are readily explainable. It is only reasonable that the lower ranked group's perception of instructional mastery should fall into a lower percentile range. It is also perfectly understandable that the scores of this group for Reference-Based Academic Self-Concept should be in the 42nd percentile, in contrast to the upper rank group's 84th percentile. This is especially true in light of the Manual's definition of this scale as "how students think other people

(teachers, family, friends) think about the student's school performance and ability to succeed academically" (p. 8). The lesson of this research technique is its limited applicability to such a research sample.

However, questionnaire data on time spent on activities and on homework serves as an indicator of personality traits such as initiative, leadership, independence and efficiency. Overall, the students in the highest ranks spent more time on activities than students in the lower ranks (see Fig. 10).

Fig. 10 Students' Distribution of Time

		Hours for Activities					Hours for Homework				
		10+	5-10	3-5	1-3	0-5	10+	5-10	3-5	1-3	0-1
Upper Ranks	M (14)	21%	14%	39%	x	30%	71%	21%	14%	0%	0%
	F (6)	67%	17%	17%	x	0%	83%	0%	17%	0%	0%
Lower Ranks	M (15)	13%	27%	13%	x	47%	7%	20%	33%	33%	7%
	F (5)	20%	40%	0%	x	40%	0%	80%	20%	0%	0%

Therefore, simply cutting down extracurricular time is not a solution to problems relating to achievement. This becomes even clearer in view of the fact that students in the upper ranks also claimed a significantly larger amount of homework time. More interesting is the observation that within the upper ranks the female students spend more time both on homework and on activities than the male students do. Lest it seem that the girls have somehow discovered the secret of creating more hours in the day, it is essential to note that, while upper-rank boys held part-time jobs, only one girl did. However, all the girls, and almost no boys, are expected to

assume family chores such as shopping, cooking, cleaning, laundry, and child care. These tasks are certainly no less time consuming although less directly reimbursed, if at all. Clearly and predictably, upper rank students used their time more efficiently, both from the standpoint of self-development and from the perspective of management. Female students appear to be even more effective time managers than male students.

In concluding this consideration of how personality affects achievement, an observation about self-esteem is essential. There is a prevailing perception among Tech students with respect to how they are viewed by the staff. According to the students, there is a none too subtle categorization into two groups: that percentage (approximately 30%) which ultimately graduates with distinction by virtue of a grade-point average over 85--and everyone else. The first group is deemed worthy of respect and praise. The efforts-and achievements-of the larger group are mostly ignored in favor of concentration on their problems and failures. There is a general lack of recognition of any intervening factors which the students in the lowest ranks may have overcome. Certainly, there is little thought given to the possibility that it is precisely their victories over obstacles to academic success that give their achievements a greater value than those accomplishments which were not the result of similar struggles. Since this self-perception crosses the boundaries of gender, ethnicity, and rank in class, perhaps this is why 35% of the research sample in the lower academic ranks considered "success"

a goal which they had not achieved.

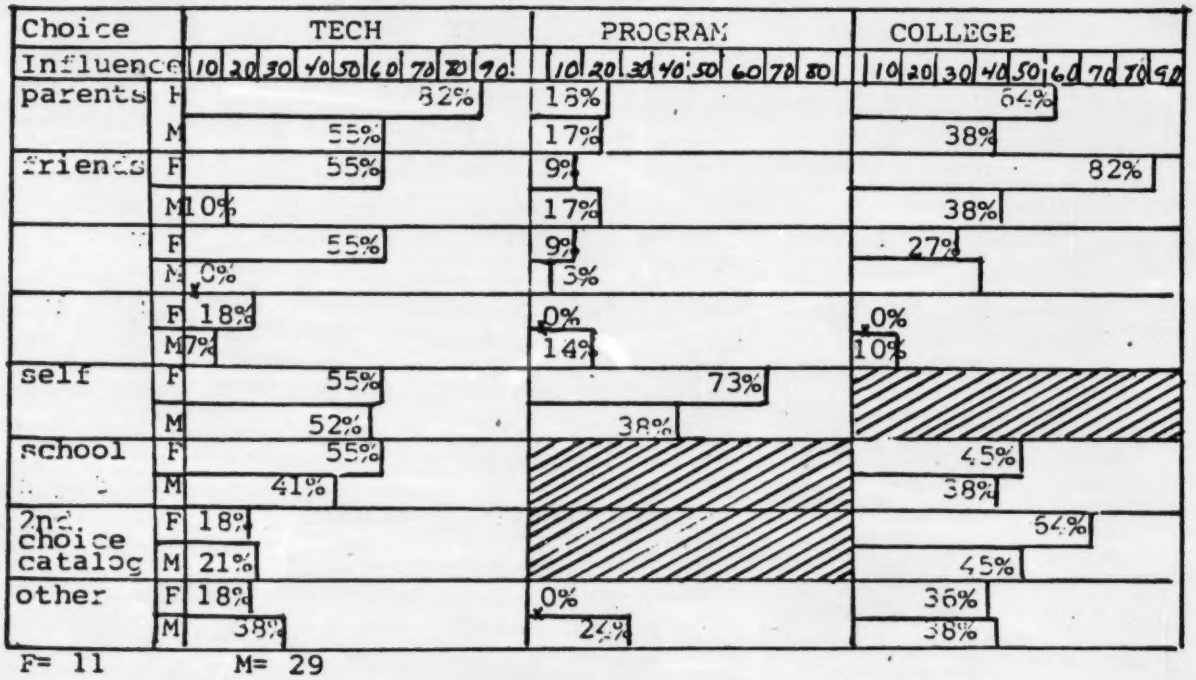
Gender and Its Role in Academic Achievement

Southwest Technical High School has only been coeducational for 13 years. Given the school's emphasis on mathematics, science, and technology, the question arises: are there any identifiable factors to account for the already documented high level of academic success achieved by Tech's female students? Do female students respond to this school culture any differently from male students?

To begin, admission to Southwest Tech is determined by performance on a competitive entrance examination, without regard to gender. Once attendance at Tech begins, boys and girls confront the same organizational structure, with no gender differentiation in programming, guidance, or grouping. How do the patterns of male and female students compare in their responses to this school culture? Not surprisingly, the decision to come to Southwest Tech was more heavily influenced by the parents and family of the girl students than of the boys (see Fig. 11). While this seems natural, the choice to attend a technically oriented high school might not be expected to receive much support from a junior high school level female peer group. The data does not so confirm, with the girls reporting a much higher percentage of peer support for this decision. Since peer reference groups at this age level tend still to be one-gendered, girls not perceiving themselves in direct competition for admission to

Southwest Tech may tend to be more supportive of those peers daring to break tradition. With little help forthcoming to either group from the elementary/junior high school guidance staffs, the boys reported significantly more support from other sources such as neighbors, family friends, and more distant relatives. Consequently, the girls were as aware of the independent decision exercised in this choice, as were the boys.

Fig. 11 Gender Comparisons Of Influence On Choices



In choosing a program of Technical concentration, there are intriguing shifts in the gender patterns of influence. Although the level of influences other than self declines for both gender groups in this decision, why do female students at Southwest Tech have a greater self-perception of independent

decision making in this choice? Parental influence is about the same for both females and males; teacher influence for both is slight, though higher for females; guidance influence, while greater than teacher influence for males, is non-existent for females; females perceived the effect of no "other" influences on this choice, while almost 25% of males spoke of the contributions of older brothers, other relatives, family friends. The telling clue appears in the decline of friends' influence in this area. Although there were some notable exceptions detailed elsewhere, most 10th grade females still seek peer support in critical decisions from their own gender. Apparently, judging by interview data, Tech females felt isolated in this particular decision. They were conscious of making a choice with little support from the school organization. In addition, they did not receive much help from any other source. Consequently they accepted responsibility for their own decisions but did not feel competent to advise their friends. In the upper ranks, female choices proved to be suitable (no changes in program of studies), leading to a bonding effect among them which helped to cope with the indifference of the school structure to their particular needs.

Because the sample was chronologically older and (optimistically) more mature at this point in their high school careers, the college selection process was assumed to be primarily a "self" decision. Surprisingly, then, parental influence on females increases, probably accounting for the

upward swing in the general sample pattern for this choice (see Fig. 1, p. 8). The 1980-81 academic year was the first time in United States history that the number of female students attending college was higher (though only slightly) than the number of males (U.S. Office of Educational Statistics). However, at Southwest Tech, the total percentage (34%) of male students reporting parents with college degrees is not substantially different from the total percentage (27%) of female students' parents earning college degrees. How, then, is it possible to account for the extent of their influences on college choices? It is possible that two factors may be at work in this multi-ethnic student population: the traditional motive of protecting daughters in unknown situations and reluctance of the young women to reject the cultural socialization processes which naturally foster involving parents in female life choices. By contrast, school influences are higher for males than for females with females again perceiving no influence from the guidance staff.

It appears that the female students (as corroborated by data from their parents, teachers, and friends) had learned an important lesson from their choice of program decision: the value of their peer networks. From that point on, strengthened by the validity of their own prior decisions, they sought, and often acted on, the advice of friends, although not necessarily of the same gender, as Fig. 11 shows about college choices. At the same time, males and females show similar percentages for the influence of school reputa-

tions, college catalogs, and other public relations information on their choices. However, females make more interactional use of these sources to facilitate and to support the decisions of their peers. Unless otherwise indicated in the discussion of other variables, the data on choice influences is true of females without regard to ethnicity or academic rank.

Fig. 12 Gender Comparison of Factors Contributing to Success, Failures, Problems

		SUCCESS			FAILURES			PROBLEMS		
Factors		1	2	3	1	2	3	1	2	3
a. parents	F	0	33	33	25	0	0	38	0	0
	M	17	21	13	12	6	6	13	6	0
b. family	F	0	29	0	0	25	0	13	26	13
	M	0	11	0	0	0	12	0	7	7
c. friends	F	0	33	22	25	25	25	13	26	13
	M	0	21	29	0	35	18	13	20	7
d. administration	F	0	11	44	0	25	0	0	26	0
	M	4	0	17	6	18	0	13	33	13
e. guidance	F	0	0	0	0	0	0	0	0	0
	M	0	0	13	0	0	12	0	6	0
f. coaches	F	0	11	0	0	0	0	0	0	0
	M	0	4	13	0	0	0	0	0	13
g. self	F	100	0	0	82	6	0	38	0	0
	M	79	8	4	50	25	0	53	13	20

Figures indicate % of respondents giving factor that rank.

		N/A (Success)	N/A (Failures)	N/A (Problems)
Total n:	M=29	M=5	M=12	M=3
	F=11	F=2	F=7	F=14

Understandably, then the data (Fig. 12) show that the female subjects of the study were quite aware of the magnitude of their accomplishments and to whom most credit should be given. They sense that success at Southwest Tech (even in the limited definition of completing the course of studies, there-

by earning a diploma) still constitutes pioneering in a society with so few women scientists and engineers. It seems only natural that all of the females in the study who had achieved the highest academic ranks (n=6) checked "not applicable" for the questionnaire items dealing with failures. By contrast, only 71% of males in the upper ranks did so.

Apparently, the "benign neglect" at Southwest Tech appears to exert a positive influence on the perceptions of female students about their accomplishments. Further examination of the data provided by the Student Attitude Measure (Fig. 9, p. 25) further illustrates the differences between the males and females. On all five scales of this measure, the percentile ranks of the female students were higher than those of the male students. Without regard to ethnicity or rank in class, the females assessed their motivation for schooling more highly. They had a stronger academic self-concept, both performance and reference-based. They had a greater sense of control over performance and a much greater sense of instructional mastery. The Reference-Based Academic Self-Concept Scale shows one of the greater ranges of differences, inasmuch as the female scores correspond to the National percentile rank of 90 while the males scores fall only in the 50 percentile.

The conclusion is inescapable: the academic ranks tell us that the female students of Southwest Tech appear in the upper ranks in greater numbers than their proportionate representation in the student population. At the same time,

the female students in both extremes of the academic ranks have a stronger perception of academic success than their male counterparts. All data sources confirm another conclusion: the female student population is profiting more from the Tech experience; further, they seem to be enjoying it more.

Summary

In spite of the limitations of sample size and the descriptive nature of the data, certain trends are apparent. Although the nature and degree of the influence varies among ethnic groups, family plays a significant role in academic achievement, both positively and negatively. Most helpful to the student is the fostering of independence and self-confidence, the sine qua non of unqualified success at Southwest Tech.

The effects of school culture on achievement are best seen from two vantage points: organizational structure and peer networking. Students are naive about how the school is structured. They passively accept decisions made for them by the school, even when those decisions negatively affect their success and achievement. Often when they credit the administration for their success, the students actually are acknowledging the influence of teachers. The guidance department, in its failure to communicate with the large majority of students, evidently contributes heavily to their sense of alienation and disaffection. Even when the students were aware of the link between the school structure and their

difficulties, they did not blame the school for their failures or their problems. Ultimately, what seems to be true is that those students who succeeded did so because they relied on themselves or on resources other than the school.

What does contribute positively to academic success is the interaction of peer networks. There was a widespread awareness, crossing gender and ethnicity, but especially in the upper ranks, of the positive influence of friends on the crucial decisions about program choice and college selection. Lower rank students recognized the contribution of peer influences on problems and failures, but they also acknowledged peer encouragement of academic efforts.

Apparently, female students have been deriving greater satisfaction from their Southwest Tech experiences than boys. Not only were their academic efforts more efficient than those of their male counterparts, but female success was also more the result of the independent decision-making resulting from the atmosphere of "benign neglect" at Southwest Tech. In addition, female students took greater advantage of peer networks which they themselves structured. Rightly, they credit themselves with their own success, irrespective of ethnicity or academic rank, and, consequently, their greater self-image emerges percentile ranks higher than the male students on all scales of the Student Attitude Measure.

In the realm of personality factors affecting achievement, motivation and independence are most significant. Ethnicity and gender are related to the degree these attributes develop.

Unfortunately, little credit is given by the school structure to the additional effort required of those students in the lower ranks upon whom intervening variables, such as poverty and family.

In conclusion, this student population reflects larger societal problems. Since the present administration (most particularly, the principal), has made a commitment to bridging the gap between the larger community environment (macro-culture) and the school setting (micro-culture), changes suggested by this research could indeed facilitate turning Southwest Tech into a model for a gifted, urban, multi-cultural, coeducational high school population.

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